



## **The control of Martian ionopause altitude by the crustal and induced magnetic field strength**

Xiuhong Han (1,2,5), Markus Fraenz (2), David Andrews (3), Yong Wei (2), Eduard Dubinin (2), Weixing Wan (1), and Stas Barabash (4)

(1) CAS Key Laboratory of Ionospheric Environment, Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, 100029, China, (2) Max Planck Institut für Sonnensystem Forschung, Katlenberg [U+2012] Lindau, Germany, (3) Swedish Institute of Space Physics, Uppsala, Sweden, (4) Swedish Institute of Space Physics, Kiruna, Sweden, (5) Graduate University of Chinese Academy of Sciences, Beijing 100049, China

The Martian ionosphere directly interacts with solar wind due to lack of a significant intrinsic magnetic field, however, the interaction is significantly influenced by the crustal field and induced field through various ways. This paper aims to study the effects of the magnetic fields on the altitude of the ionopause, which separates solar wind and ionosphere. We determine the ionopause based on the local electron density profile measured by MARSIS and the photoelectron boundary measured by ASPERA-3, and then study the relationship between the ionopause altitude and the crustal and induced field. The results show that the altitude of ionopause has a good linear relation with the natural logarithm of both the crustal and induced field (increase with the crustal field and decrease with the induced field, respectively). Furthermore, the effect of the crustal field decays quickly above  $\sim 450$  km, and we found the reason is that the magnetic pressure attenuates rapidly.